

SYLLABUS
of the educational component
«Biology and Fundamentals of Genetics»

for higher education students of the 1st course of full-time education
 educational program "Pharmacy"
 specialty "226 Pharmacy, industrial pharmacy"
 specialization "226.01 Pharmacy"
 field of knowledge "22 Health"
 master's level of higher education

TEACHERS

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1. The name of higher education establishment and department: National University of Pharmacy, Department of Biological chemistry and Veterinary medicine.

2. Address of the department: Kharkiv, Kulikovska str., 12, ground floor, т. 057-706-30-99.

3. Web site of the department: <https://biochem.nuph.edu.ua/?lang=en>

4. Information about teachers:

Senyuk Igor

PhD, associated professor of the Department of Biological chemistry and Veterinary medicine of National University of Pharmacy. Experience of scientific and pedagogical work – 30 years. He teaches courses "Biological Chemistry", "Functional Biochemistry". Research interests: study of mechanisms of pathogenesis and ways of correction of hepatobiliary system.

Galyzinskaya Lubov

PhD, Associate Professor of the Department of Biological Chemistry and Veterinary Medicine of the National University of Pharmacy. Experience of scientific and pedagogical work – 23 years. She teaches courses: "Biological Chemistry", "General Biochemistry and Molecular Biology", "Biochemistry", "Functional

Biochemistry", "Environmental Biochemistry". Research interests: biochemistry, pharmacology, clinical biochemistry.

5. Consultations: Every day you can send your questions to the forum. The given day for discipline.

6. Abstract of the educational component: the educational component "Biology and Fundamentals of biology for further assimilation by students of a block of disciplines that provide natural-scientific and professional-practical training. Genetics" is an educational discipline aimed at forming knowledge and practical skills in human

7. The purpose of teaching the educational component: the purpose of teaching the educational component "Biology with the Basics of Genetics" is to lay the foundation for further assimilation of knowledge and skills by students in specialized theoretical and clinical professional-practical disciplines (biological and bioorganic chemistry, anatomy, physiology, genetics, parasitology, pharmacogenetics, microbiology with the basics of immunology, etc.).

8. Competencies and learning outcomes

The educational component "Biology and Fundamentals of Genetics" ensures that students acquire the following competencies:

Soft- skills / General competences (GC)

GC 1. The ability to act socially responsibly and civically.

GC 2. Ability to apply knowledge in practical situations, make informed decisions.

GC 3. Efforts to preserve the environment.

GC 4. Ability to think abstractly, analyze and synthesize, learn, and be modernly educated.

GC 5. The ability to show initiative and entrepreneurship.

GC 6. Knowledge and understanding of the subject area and understanding of professional activity.

GC 7. Ability to adapt and act in a new situation.

GC 8. The ability to communicate in the state language both orally and in writing, the ability to communicate in a foreign language (mainly English) at a level that ensures effective professional activity.

GC 9. Skills in using information and communication technologies.

GC 10. The ability to choose a communication strategy, the ability to work in a team and with experts from other fields of knowledge/types of economic activity.

GC 11. Ability to evaluate and ensure the quality of performed works. GC 12. Ability to conduct research at the appropriate level.

Hard-skills / Professional competences of the specialty (PC)

PC 1. The ability to carry out sanitary and educational work among the population for the purpose of prevention of common diseases, prevention of dangerous infectious, viral, and parasitic diseases, as well as for the purpose of promoting timely detection and support of adherence to the treatment of these diseases in accordance with their medical and biological characteristics and microbiological features.

PC 3. The ability to provide pre-medical assistance to the sick and injured in extreme situations and emergencies.

PC 19. The ability to apply methods of identification of the condition of the skin and its appendages, to differentiate their features depending on the individual properties of the body, age, gender of the client, etc., to implement technologies for diagnosing the condition of the client's skin in a comprehensive scheme of care for the skin and its appendages and correction of cosmetic defects in conditions cosmetology institution, implement cosmetology care technologies taking into account their features.

9. Program learning outcomes: Integrative final program learning outcomes (PLO), the formation of which is facilitated by the educational component "Biology and Fundamentals of Genetics".

PLO 1. To carry out professional activities in social interaction based on humanistic and ethical principles; to identify future professional activity as socially significant for human health.

PLO 2. Apply knowledge from general and specialized disciplines in professional activities.

PLO 3. To comply with the norms of the sanitary and hygienic regime and the requirements of safety equipment when carrying out professional activities.

PLO 4. Demonstrate the ability to independently search, analyze and synthesize information from various sources and use these results to solve typical and complex specialized tasks of professional activity.

PLO 7. Perform professional activities using creative methods and approaches.

PLO 8. To carry out professional communication in the state language, use oral communication skills in a foreign language, analyzing specialized texts and translating foreign language information sources.

PLO 9. To carry out professional activities using information technologies, "Information databases", navigation systems, Internet resources, software and other information and communication technologies.

PLO 10. Adhere to the norms of communication in professional interaction with colleagues, management, consumers, work effectively in a team.

10. Status of educational component: selective.

11. Prerequisites of the educational component: having a complete general secondary education with the study of biology and chemistry.

12. The amount of the educational component: 120 hours (4 ECTS credits), of which: lectures – 18 hours, practical classes – 36 hours, independent work – 68 hours.

13. Training organization:

The format of teaching the educational component: lectures and conducting practical classes.

Content of the educational component:

Module 1. Biological features of human life

Topic 1. Introduction to biology. Basic methods of biological research. Rules of light microscopy. Microscopic methods of biological research.

Topic 2. The cell is the main structural and functional unit of living things. Elemental and chemical composition of the cell. The main structural components of the cell. Cell theory.

Topic 3. Biomembranes: structure and functions. Types of membrane transport.

Topic 4. Asexual and sexual reproduction. Cell cycle. Mitosis.

Module 2. Biology of individual development

Topic 5. Sex cells. Meiosis. Gametogenesis.

Topic 6. Biological features of human reproduction. Fertilization. Methods of contraception.

Topic 7. Basic morphophysiological characteristics and stages of ontogenesis. Critical periods of development.

Topic 8. Basics of gerontology and geriatrics. Old age as a stage of ontogenesis. Theories of aging.

Module 3. Basics of human genetics

Topic 9. Introduction to genetics, basic concepts. Independent inheritance of genes.

Topic 10. Methods of genetic research.

Topic 11. Linked inheritance. Gender genetics. Theory of gender determination.

Topic 12. Variability. Hereditary human diseases.

Module 4. Basics of medical parasitology

Topic 13. Biological bases of parasitism and parasitic invasions in humans.

Topic 14. Medical protozoology.

Topic 15. Medical helminthology.

Topic 16. Medical arachnoentomology.

14. Types and forms of control:

Current control: oral survey, writing test tasks, solving situational (calculation) problems.

Control of content modules: oral survey, preparation of test tasks, solution of situational (calculation) problems.

Semester control form: semester credit/semester differentiated credit.

Conditions for admission to the control of content modules: for admission to the control of content modules, it is necessary to have a minimum number of points for the topics (lessons) of the previous content module.

Conditions for admission to the semester control: current rating of more than 60 points, absence of unworked absences of practical classes, fulfillment of all requirements stipulated by the work program of the educational component.

15. The educational component evaluation system: The results of the semester control in the form of a semester credit are evaluated on a 100-point, undifferentiated scale ("passed", "failed") and on the ECTS scale.

Points from the educational component are calculated according to the following ratio:

Types of assessment	Maximum number of points (% of the number of points per module - for content modules)
Content module 1: ... - evaluation of topics (1-4) - (class work: oral survey, writing test tasks, solving situational (calculation) problems; - - control of content module 1 (writing test tasks, solving situational (calculation) problems)	25 %
Content module 2: ... - evaluation of topics (5-8) - (class work: oral survey, writing test tasks, solving situational (calculation) problems; control of content module 1 (writing test tasks, solving situational (calculation) problems)	25 %
Content module 3: ... - evaluation of topics (9-12) - (class work: oral survey, writing test tasks, solving situational (calculation) problems; control of content module 1 (writing test tasks, solving situational (calculation) problems)	25 %
Content module 4: ... - evaluation of topics (12-16) - (class work: oral survey, writing test tasks, solving situational (calculation) problems; control of content module 1 (writing test tasks, solving situational (calculation) problems)	25 %
Semester control	100%

The independent work of students of higher education is evaluated during the current control and during the control of the content module.

16. The policy of the educational component: The policy of the educational component ("rules of the game") is determined by the requirements of the department to the student of higher education when studying the educational component regarding academic integrity, regarding attending classes, regarding deadlines, working out, increasing the rating, liquidating academic debt, regarding contesting the assessment from the educational component (appeals), etc. .

The academic integrity policy is based on the principles of academic integrity stated in the POL "On measures to prevent cases of academic plagiarism at the National University of Pharmacy. Writing off when evaluating the success of a student of higher education during control activities in practical classes, control of content modules and semester exams is prohibited (including using mobile devices). Abstracts must have correct text references to the used literature. The detection of signs of academic dishonesty in the student's written work is a reason for the teacher not to enroll it.

Class attendance policy. A student of higher education is obliged to attend classes (POL "On the organization of the educational process of the National University of Pharmacy") according to the schedule (<https://nuph.edu.ua/rozklad-zanyat/>), to observe ethical norms of behavior.

Policy regarding deadlines, working out, rating increase, liquidation of academic debt. Completion of missed classes by a student of higher education is carried out in accordance with the POL "Regulations on the completion of missed classes by students and the procedure for eliminating academic differences in curricula at the National University of Pharmacy" in accordance with the schedule of missed classes set by the department.

Increasing the rating and liquidating academic debt from the educational component is carried out by the students in accordance with the procedure specified in the POL "On the procedure for evaluating the results of training of students of higher education at the National University of Pharmacy". Applicants of higher education are obliged to comply with all deadlines set by the department for the completion of written works from the educational component. Works that are submitted late without valid reasons are assessed at a

lower grade - up to 20% of the maximum number of points for this type of work.

Policy on appeals of assessment from the educational component (appeals). Applicants of higher education have the right to contest (appeal) the evaluation of the educational component obtained during control measures. The appeal is carried out in accordance with the POL "Regulations on appealing the results of the semester control of the knowledge of students of higher education at the National University of Pharmacy".

17. Informational and educational and methodological support of the educational component:

Mandatory literature	<ol style="list-style-type: none"> 1. https://www.researchgate.net/publication/41554841_Systems_Biology_A_Textbook 2. https://openstax.org/books/concepts-biology/pages/1-introduction 3. A scientific journal of original research in all fields of biology https://www.cell.com/current-biology/home
Additional literature for in-depth study of the educational component	<ol style="list-style-type: none"> 1. Медична біологія: посібник з практичних занять / О.В. Романенко, М.Г. Кравчук, В.М. Грінкевич, О.В. Костилюв. — 2-е видання, 2020 р, 472 с. 2. Практикум з медичної біології: навчальний посібник (ВНЗ І—ІІІ р. а.) / Н.О. Саляк. — 3-є вид., переробл. і допов. 2017 р., 296 с. 3. Гістологія: підручник і атлас. З основами клітинної та молекулярної біології: 8-е видання: у 2 томах. Том 1 / Войцех Павліна, Майкл Г. Росс, 2021 р, 462 с. 4. Інфекційні хвороби: підручник / О.А. Голубовська, М.А. Андрейчин, А.В. Шкурба та ін. — 4-е видання, 2022 р, 464 с. 5. Інфекційні хвороби: підручник / В.М. Козько, Г.О. Соломенник, К.В. Юрко та ін., 2019 р., 319 с. 6. Медична паразитологія з ентомологією: навчальний посібник / В.М. Козько, В.В. М'ясоєдов, Г.О. Соломенник та ін., 2015 р., 336 с.
Actual electronic information resources (magazines, sites, etc.) for in-depth study of the educational component	<ol style="list-style-type: none"> 1. Website of the Ministry of Health of Ukraine – https://moz.gov.ua/ 2. Website of the World Health Organization - https://www.who.int/en/ 3. Website of the National Scientific Medical Library of Ukraine – https://library.gov.ua/ 4. Encyclopedia of modern Ukraine https://esu.com.ua/article-66062 5. State Expert Center of the Ministry of Health of Ukraine https://www.dec.gov.ua/cat_mtd/genetika/ 6. Electronic database of medical and biological publications https://pubmed.ncbi.nlm.nih.gov/ 7. National Medical Library https://www.nlm.nih.gov/medline/medline_overview.html
Moodle distance learning system	<p>https://pharmel.kharkiv.edu/moodle/course/view.php?id=1621</p>

18. Technical and software support of the educational component: multimedia equipment, lecture notes, methodical recommendations, microscopic preparations of animals, microscopic techniques and equipment.